



Chambers's Journal

SIXTH SERIES.

OLD-AGE PENSIONS.

NEVER since the Poor Law system was established in this country, provision has been made for the support of the aged and of such as are unable to work, either by granting them outdoor relief, or, in the cases where that is found insufficient, by receiving them into the workhouse, where food, clothing, and all that is necessary for their maintenance in health and comfort are supplied at the public charge. The number of persons thus supported forms a varying but always a considerable percentage of the population, and the expense thus incurred is a heavy burden on the resources and industry of the community.

While it is true that persons in various ranks of society are compelled through accident or by stress of circumstances to seek assistance from the poor-rate, it is at the same time found that every one who prizes his independence at its just value shrinks from the idea of asking relief from the parish. All classes of workmen, skilled and unskilled alike, and all persons above that rank of life, endeavour to place themselves in a position in which they will be able to maintain themselves without drawing upon funds which are commonly considered the last resource of the distressed.

The thrifty members of the community usually provide against a rainy day, and the attacks of sickness to which all are liable, by opening an account with a savings-bank or by joining a benefit club. Since the savings-bank has been made a department of the Post Office it has been placed within the reach of every one, and great and ever-increasing use has been made of it; while benefit clubs, with their sick and funeral funds, have furnished their members with means on those occasions when they prove of the greatest service to them and their families.

Before the passing of the Friendly Societies Act of 1875 benefit clubs were of two kinds—the permanent and the terminable. In the former class, which includes several old and well-known institutions, the weekly payments of a member

ensured him sick pay during illness, and a sum of money payable at his death which covered the expense of his funeral. As long as the member made his payments regularly he secured these two benefits; but it was perfectly understood that, however long a member kept up his payments, he obtained no further claim upon the large accumulated funds of the society, which were the sole property of the capitalists who owned the concern, and who reaped an ample return for their investments by the careful manner in which a body of managers conducted the business in their behalf. On the other hand, the terminable benefit clubs were also unsatisfactory. The members of these clubs were the sole owners of all the money belonging to their club; but the clubs were exposed to two risks, either of which might prove fatal to their existence. Clubs of this description were generally local in their operation, so that when an epidemic of sickness had to be met, and the means at their disposal were not sufficient for the emergency, the club came to an end. Again, if an ample sum of money was laid by as a reserve fund to meet such a contingency, the members were tempted to dissolve their club and share the money among themselves; thus a fund which should have been a pillar of strength to the club proved the instrument of its destruction. Such was the constitution of the two classes of benefit clubs which offered a sick and a funeral fund to their members before the passing of the Friendly Societies Act of 1875; but that act permitted a great and important change to be effected in these clubs.

What the act of 1875 effected was this—it permitted what was good in the permanent and terminable clubs to be combined. In other words, it allowed a club to be permanent, and, at the same time, it secured all the money of the club for the sole benefit of its members.

As soon as the act of 1875 was passed the late Mr George Holloway drew up a set of rules and registered a benefit club for Stroud, which secured, in addition to the usual sick and funeral funds,

an old-age pension. This was a new principle in benefit clubs, and the inhabitants of Stroud accepted the boon with a readiness which has been described as extraordinary. This was, no doubt, partly due to the intelligence of the skilled operatives engaged in the woollen manufacture of the west of England, and partly to the able advocacy of the founder of the club. Seventeen years subsequent to the establishment of the club Mr Holloway wrote that if the industrial classes would only avail themselves of the permission given them to establish benefit clubs on the new principle, 'there would soon be a perceptible decrease of pauperism, which so disgraces this prosperous country, rates would be correspondingly reduced, and the rising generation of working men would look forward to comfortable independence in their old age' (Letter in *National Review*, March 1892).

An incident in the history of benefit clubs gave unexpected publicity to the scheme adopted in Stroud. In the autumn of 1877 the Right Hon. W. E. Forster, then President of the Local Government Board, and who had the friendly societies under his jurisdiction, was invited to address an Oddfellows' meeting. While praising that society for the good work it was doing, he pointed out that their work was by no means complete, as it did not touch the question of help for old age. He thereupon announced that, in order to encourage self-help among operatives, he was prepared to give £50 in prizes for the best essays by members of benefit clubs calculated to effect this object. Of the three successful essays, one was written by Mr Holloway; and as they were afterwards published, the plan proposed by him—which was already in full working order—was in this way made widely known.

As a mark of respect for the good service he had done to the town and neighbourhood the electors of Stroud chose Mr Holloway to represent them in parliament. From his special knowledge of the subject he was nominated a member of the parliamentary commission appointed to examine Mr Chamberlain's proposal to grant help in securing old-age pensions; but, as the proposal excluded payment during sickness, Mr Holloway withdrew from the commission, as he was convinced that such a scheme would not be acceptable to the persons whom it was sought to benefit. The commissioners began their inquiry in due course, and examined all the schemes brought before them which proposed to combine State aid with the contributions of individuals to secure these pensions. The report of their completed work has just been issued, and in it they declare that no plan they have considered which is based on the principle of supplementing the savings of the industrious with parliamentary grants would be workable. The whole question, in fact, is judged by them to lie outside the sphere of practical politics. This report has been widely commented upon

and criticised, and Mr Lionel Holland, M.P., has reviewed it in a small volume, *Suggestions for a Scheme of Old-Age Pensions*.

The Stroud scheme, which comprehends a sick fund, a funeral fund, and an old-age pension is perfectly simple and intelligible. A choice of six rates of payment is offered, beginning as low as a halfpenny a day, and reaching as much as threepence a day. Suppose the rate of a penny a day is chosen; this amounts to sevenpence a week, and two shillings and fourpence a month. The regular payment of this entitles a person who enters at any age between sixteen and thirty to sick pay of ten shillings a week, and his proportionate share of the capital of the club, which is calculated at the close of each financial year. The subscription to the funeral fund, which is a small item, is collected independently. When a member reaches the age of thirty his regular payment of sevenpence a week is increased each succeeding year by the net sum of sixpence per annum; thus in his thirty-fifth year he pays two shillings and sixpence extra, at forty years five shillings extra, and at fifty years ten shillings extra. These extra payments are necessary inasmuch as the average sickness increases as a member advances in years. The official tables show that the liability to sickness between sixteen and thirty is nearly stationary, and averages $6\frac{1}{2}$ days per annum; above thirty the liability increases every year, the average being $7\frac{1}{2}$ days; at forty it is 9 days, and at fifty it is 12 days. In the case of a member whose subscription is twopence a day, his extra payments to meet sickness are twice as much as those of the member who subscribes one penny a day, and he is entitled to twenty shillings a week of sick pay; in the case of a member whose subscription is threepence a day, his extra payments are trebled, and he receives thirty shillings a week sick pay.

At the end of each financial year a valuation of the property of the club is made, and the whole of it is divided among the members in proportion to the rate of their subscriptions—that is, the member who has paid one penny a day receives one share, and those who have paid twopence and threepence receive two and three shares respectively. The money is divided, but it is *not* distributed, and each member has a pass-book in which the money to which he is entitled is entered. A member who pays one penny a day may anticipate an accumulation of wealth on the following scale:

In 10 years.....	£12 11 5
" 20 "	33 0 9
" 30 "	66 7 7
" 40 "	120 13 7
" 50 "	208 1 8

At the age of sixty-five a member's connection with the club ends, unless he desires to keep up his payments to the funeral fund and secure the benefit which thence accrues. When he leaves the

club he finds himself the possessor of about £200, which he can invest if he pleases in the purchase of an old-age annuity from government which will bring something like £20 a year as long as he lives. Those members who have paid twopence and threepence a day to the club will be able to secure annuities of £40 and £60 respectively.

A member who for any cause wishes to leave the club may do so on forfeiting his two last years' shares of the surplus funds by way of compensation.

Such is an outline of the manner in which the Stroud club is managed. In addition to the usual sick and funeral funds, it secures to its members old-age pensions without asking a farthing from the parish rates or the national exchequer.

An account of the Stroud benefit club having reached Tunbridge Wells, it was resolved by a small number of the residents in that town to establish a similar society in the south-eastern counties. This was done in 1881, and there are now twenty-five agencies at work, with a membership of about two thousand. A few modifications of the original Stroud scheme have been made, the most important of which is an advantage to

the members and a credit to the sagacity of 'The Men of Kent' who devised it. In the Stroud club, if a member desired, for any reason, to get a portion of the money placed to his credit and due to him, he could only do so by withdrawing from the club altogether, or by waiting till he reached the age of sixty-five, when his connection with the club came to an end. In the Tunbridge Wells club, a member is allowed to take out the whole of the capital that belongs to him, except four pounds, and still retain all the privileges of membership. Permission to withdraw a sum of forty or fifty pounds, which a member may require to assist him in purchasing a cottage or extending his business, is an obvious advantage. Other modifications will probably suggest themselves as these new benefit clubs are established in other towns and districts of the country. The fundamental idea of the scheme, however, which is provision for old age, will doubtless be jealously maintained; and the result of a general adoption of this class of clubs will be a comfort to the thrifty and industrious, the outlook for their declining years will be brightened, and the dread of the workhouse, which haunts so many, will be taken away.

THE SHIP-BREAKERS.

A FENLAND ROMANCE.

CHAPTER III.—RUTH.

THE letter from Gabriel Beek, which Hettie had given her father, had helped to confirm her fears. Her brother had confessed to an 'unlucky speculation' with the three thousand pounds; and the old ship-breaker, with his business affairs in dire confusion, had not had the strength to confront the pending disaster. From the moment that Jarvis had found him lying in an unconscious state upon the office floor Mr Beek had uttered no coherent words. Before morning broke he had breathed his last.

Some weeks went by. No further news of Gabriel reached Cablethorpe. It was reported—and the report was traced to lawyer Burtenshaw—that the ship-breaker's son had gone abroad, and would never set foot inside the gates of the timber-yard again. But as to what had actually become of Gabriel Beek, or what would become of him, nobody seemed to possess any very precise information.

One winter's day Mr Burtenshaw, presenting himself at the gates, was conducted into the private room of his late client. That grim smile was again on his face. Is it possible that he recalled to mind a certain gusty day in autumn? He stood at the window, raised his *pince-nez* deliberately, and looked down upon Beek & Son's timber-yard. In a field beyond the yard an

auction sale of ship-wood was going on. Jarvis, who was still 'Beek's manager,' was stepping round the field, followed by a crowd of men who were bidding against each other. Lot after lot, piled up in a separate timber-heap, was being 'knocked down.'

Presently Hettie Beek appeared on the scene; and, to Mr Burtenshaw's surprise, the girl stepped into the manager's place as auctioneer. She took the walking-stick with which Jarvis had been knocking down the lots, and, stepping on to a pile of ship-wood, began to conduct the sale. Jarvis left the field.

A minute later he entered the office. Mr Burtenshaw was still watching Hettie with apparent interest. He dropped his glasses and glanced round.

'Well, John, you want to see me, I understand,' said the lawyer. 'What can I do for you?'

John Jarvis was a dark, good-looking fellow of twenty-eight. The weeks that had gone by since Mr Beek's death had altered his face, as the lawyer observed. He had grown more stern and determined. He seemed fully aware that the onus of Beek & Son's affairs had devolved upon him. While occupying the post of head-clerk, during Mr Beek's lifetime he had never asserted himself. Lawyer Burtenshaw, as he followed John's glance towards the 'auction field,' became

confident that the manager was contending for something more vital to himself than the mere reconstruction of the dead ship-breaker's ruined house.

'A chance has occurred, Mr Burtenshaw,' said Jarvis, 'of doing a stroke of business. A little ready money is needed.'

'What's the business?' said Mr Burtenshaw.

Jarvis drew a note-book from his pocket. A number of old hulks, he explained to the lawyer in detail, were offered for sale at Grimsby. If purchased at once, brought down to Cablethorpe by tug, and broken up and sold for ship-wood, a handsome profit would accrue.

'How much do you want?' said the lawyer.

Again Jarvis consulted his note-book, and then named a sum.

'Indeed! And now, perhaps,' pursued Mr Burtenshaw, 'you'll tell me, my friend, why you come to me? I'm not a money-lender.'

'You've advanced money to the firm,' said Jarvis. 'We are deeply in your debt. A few contracts might lift us out of our difficulties.'

'Ah! Now I'll tell you what it is, John!' said Mr Burtenshaw. 'You have got it into your head—possibly because Mr Beek was an old client of mine—that I'm ready to put his house in order. You never made a greater mistake. What right have you to suppose such a thing?'

Jarvis remained discreetly silent.

'I am ready to admit, however,' said the lawyer, 'that I have a thorough belief in your business capacities. I will even go so far as to say, supposing Beek & Son was transformed into a company, with you as managing director, I might be tempted to put capital into it. But it's useless to speak of that.'

'Why useless, sir?' said John, with an eager look.

'You would never agree to the terms,' said Mr Burtenshaw. 'I should impose very stringent conditions.'

'Let me know them,' said John.

Mr Burtenshaw looked thoughtful.

'If you are as shrewd,' said he, 'as I give you credit for being, you will have almost guessed the conditions. Perhaps you think that I have an affection for this Beek family—do you?'

'No affection, at least, for Gabriel Beek,' said Jarvis.

'Have you?' said the lawyer snappishly.

An angry flash lit up John's eyes.

'Mr Burtenshaw,' said he, 'you cannot be ignorant of the fact that Gabriel has stood in my way from first to last! I have been the bone of contention, so to speak, between him and his father for years. He did everything in his power to turn Mr Beek against me. But I've managed to hold my own. From the time I was taken into Beek & Son's service, as a boy in the timber-yard, I have risen step by step. Gabriel Beek's

opposition spurred me on! The business is now practically in my hands. What is Gabriel Beek to me? If he showed his face at the gates—if he put one foot into the timber-yard—I would do my best to drive him forth. I have good reason to hate him!' He clenched his hands as he spoke, as though to emphasise his passionate sense of resentment.

Mr Burtenshaw smiled approvingly. Then he went to the window. The sale of ship-wood was finished. Hettie had disappeared. 'You hate the fellow, do you, John?' said he, fixing a keen look on the manager.

'Yes!'

'You've another reason to hate him than you have told me of,' the lawyer insisted. 'Is that your secret?'

'Perhaps. At least,' said John, 'I would rather not speak of it just now.'

Mr Burtenshaw rose and rested his hand on John's shoulder. 'My friend,' said he soothingly, 'we'll speak of it another time. I'll see what can be done about the money. You shall hear from me. Good-night.'

The wintry day was closing in. Mr Burtenshaw was gone. Jarvis lighted the lamp over the old ship-breaker's desk, and seated himself there with a sense of exaltation strong upon him. He knew—though the lawyer had been careful not to commit himself—that Mr Burtenshaw had long striven to get the firm into his power. Nor was it purely for the sake of greed. A sense of intense repulsion had existed between Gabriel Beek and the lawyer for years past. It had only needed a calamity such as the present one, as Jarvis conceived, to make Mr Burtenshaw complete master of the situation.

A bond of sympathy—the mutual hatred of Gabriel Beek—had made it possible for Jarvis to work in harmony with lawyer Burtenshaw. But it must not be supposed that Jarvis would, on that account, have condescended to listen to any unscrupulous conditions. Nothing was further from his thoughts. No brilliant promise of wealth would have tempted him to act contrary to the interests of the old house. And yet he was somewhat dazzled, just for the moment, by the ambitious thoughts that began to crowd his brain. In a few weeks' time, at the utmost, the business of Beek & Son would belong to him! He took up one of Mr Beek's pens, corroded with the ink with which Mr Beek had written last, and wrote across a sheet of paper, '*Beek and Son, Limited. John Jarvis, Managing Director.*' Then he leant back in the chair and contemplated the words with a look of stern purpose, indenting the penholder deeply with his teeth. And so lost in thought did he presently become that, vision after vision of wealth passing before his eyes, he failed to hear a light footstep outside. Before he was aware of it Hettie Beek, creeping up behind his chair, was looking down over his shoulder.

'John! what keeps you here so late?'

Jarvis covered the paper with his hand, as though he were conscious of having done a guilty thing. And yet he had, a moment before, craved to express this written thought to this girl. Perhaps her look—or the dread lest she should misinterpret the scribbled words—gave him the courage he had lacked until now.

He rose from the desk and said, 'Hettie'—he had not called her by her Christian name for many a day—'I am going to take your father's place.'

For a moment Hettie had a perplexed look. But her expression suddenly showed that she had grasped the situation. She spoke in a tone that sounded almost resentful.

'This is Mr Burtenshaw's doing?'

'Yes. The business will be worked with his money.'

'Don't trust him, John,' said Hettie, placing her hand on his arm—'don't trust him! He means us no good. Haven't you learnt that yet?'

'Long ago. But capital must be found,' said Jarvis, 'and no one else will help us.'

'Then why should he? Be frank with me, John,' said Hettie. 'Why should this hard lawyer turn soft-headed?'

'No reason whatever! He's a rich man,' said John, 'and he believes in me—has always believed in me—as a reliable man of business. He looks upon Beek & Son as a good investment. That is all.'

Still Hettie showed no sign of being satisfied. 'It's not that,' said she; 'I can't believe it. Mr Burtenshaw is a crafty schemer. Don't have anything to do with him. If you do, John, you will live to repent.'

For a moment Jarvis made no reply. Then he spoke. 'Hettie,' said he, 'don't think that I wish to oppose you. I've no such desire. The only desire I have—you must have guessed it long ago—is to serve you. It may be that I am placing myself in Mr Burtenshaw's power. But I shall save the house.'

Hettie sank down into her father's chair. 'No, John—no,' said she; 'you have made sacrifice enough already for us. Avoid the man; don't enter into any league with him. Let him do his worst.'

Jarvis looked troubled. 'Can you really wish that? If you were not as conversant with the affairs of the house as I am, Hettie, I could more easily credit your words. Let him do his worst? You know what that means. The business would be sold. You and your sister would be cast out, and the power to help you would be taken from me!'

The girl bent her head upon her hands.

'It is for you, Hettie—for you,' said Jarvis, bending down over her as she still sat at the dead ship-breaker's desk, 'that I'm making terms with this man. You and Ruth will be enabled to go on living in comfort, as you have always been

accustomed to live, instead of being forced to face the world. It may even be that I shall gain a fortune for you in time. I will work from morning to night with that one end in view. Don't deny me the one happiness left me in life.'

Hettie looked up and held out her hands. 'How good you are,' she said, 'to Ruth and me! I wish my father were alive to hear. But he knew your worth. He was never deceived in his estimate of you.'

Then she rose and moved away.

'You will not oppose me?' said Jarvis, holding open the door.

'No. I have uttered my protest,' said she; 'do as you will.'

Jarvis paced Mr Beek's room with a restless step for a time. Then he took down the lantern from its place in the outer office, lighted it, and went on his usual nightly round of yard and warehouse. Then he went up the straight, narrow staircase which led to his own room on the upper floor of the warehouse.

He placed the lantern on the table, put a match to the stove, and sat down before it. The step he had taken to-day—the result of his talk with Mr Burtenshaw—troubled him. He had taken a leap in semi-darkness. Would it bring him perceptibly nearer to Hettie Beek? Time would show. If the lawyer had asked him to barter his soul he would have done so if by the bargain a chance were given him of winning this girl.

Hettie crossed over into the house. She entered a cosy parlour. From the windows that looked out up the fenlands the distant wolds could be seen. The flush of a crimson sunset was fading out of the sky, with the wolds forming a dark line along the horizon just beneath. The girl glanced round the room. Her sister was seated at a cottage-piano near one of the windows. She stopped playing and looked round. Hettie took a seat beside her, and told her all that had passed between her and Jarvis in the office a moment ago.

'Now, Ruth,' she asked in conclusion, 'what's your verdict?'

Ruth's features, small and exquisitely shaped, were like Hettie's; but Hettie's face was rosy and animated, while the other's was wanting in life and colour. But as Ruth exclaimed indignantly, 'Surely you'll not consent to this?' her face grew more crimson than the sunset glow.

'Beggars can't be choosers, dear,' said Hettie. 'I have consented. Jarvis is sanguine of success. He is bent on making our fortunes.'

'Have you lost all pride, Hettie?' said Ruth. 'We owe all our troubles to lawyer Burtenshaw. He caught Gabriel in his toils—father too. He will catch John now.'

'Possibly. But John is shrewd enough,' said Hettie. 'He can defend himself. The recollection that you and I are dependent on his efforts, Ruth, will be sure to rouse in him all his best energies. Ah, my dear, what a true friend he is!'

Ruth looked searchingly into her sister's face. The firelight touched Hettie's profile and brought it into strong relief. The flushed cheek, the exquisite curve of chin, the dark quivering lashes—all helped to express admiration and enthusiasm. The tone, too, in which she spoke was emotional. Did she love this man? That seemed the question that was trembling on Ruth's pale lips; and then her delicate face grew white, and she leant back in her chair shrinkingly, as the shadow shrinks when an elastic flame looks up out of the fire.

'I cannot bear this!' cried Ruth, rising suddenly and moving across the room. An agonising sob escaped her as she sank down beside the hearth. Hettie knelt at the chair-side, and with sudden impulse put her arms about her sister. 'Ruth, my dear, what is it?'

For a while there was no answer. 'I can't stay here. I can bear it no longer.' This was Ruth's low cry.

Hettie looked at her perplexedly. 'Shall I never understand you?' said she. 'I thought it was your wish to stay. Would you prefer to face poverty? Dear Ruth, you are far too delicate. The hardship and privation to which we should be exposed would kill you.'

'I shouldn't mind that,' said Ruth, with a resolute face. 'He doesn't love me! Why should I care to live?'

Still Hettie looked perplexed. But Ruth, not seeing her face, and misinterpreting her silence, hastened to unburden her mind of the load she could no longer bear.

'I would have kept my secret—kept it even from you,' said she in a broken voice, 'if I could have done so. It has been mine for months—for years past. When he worked in the yard, before he rose to be a clerk in father's office, the mere sight of him was a happiness to me. How hard he has always worked! Is it part of my weakness—he is so strong and brave—to love him so? Every one praised him—every one, except Gabriel. He was jealous of him—hated him, I firmly believe.

The men's characters are so different! The one a visionary, indolent and irresolute; the other practical, full of energy and force. Are not such men born to disagree? I have watched them together many a time. The unjust hatred of Gabriel roused my indignation; and how it increased my love! But what could a feeble, wretched woman do? If I had been blessed with health and strength like yours, Hettie, I would have left home months ago. Is there no way of escape from this misery now?'

She spoke appealingly, not meeting Hettie's look, but with her eyes fixed upon the fire. The flames leapt high, and set a glow upon her face that seemed like mockery at such a moment.

'But I've not yet told you all,' said Ruth, lowering her voice. 'He loves another. He has loved her for ever so long! I can recall—so at least it seems to me—the very day on which his love began—almost the hour. Since then he has toiled day and night with one persistent thought—the thought of making her his wife! Dear Hettie!—it is you!'

At this moment Ruth heard John's step in the timber-yard, and knew that he was coming in. It had been his privilege, ever since he had held the position of manager, to sup in this cosy parlour with the Beek family;—and this hour in the twenty-four had frequently brought to Ruth a painful glimpse of happiness. From the instant of waking each morning she had wished that evening would come. It is true that most of John's attention was bestowed upon Hettie; still, one word or look from Jarvis made up for all the neglect. His indifference caused her to think the more, and with every thought of him her love had grown stronger. But to-night, since she had entrusted the secret to Hettie, she shrank from the prospect of meeting Jarvis face to face. She dreaded lest her flushed cheeks or her faltering voice, or even a glance from her discreet sister, should betray her to him. She rose hastily, and, pleading a headache, went to her own room.

A REVOLUTION IN IRON-MINING.

ALL ABOUT EDISON'S LATEST.

By FREDERICK A. TALBOT.



PROBABLY the great majority of people have read how, in a hypothetical war between this country and the United States, the utter annihilation of the British Isles is brought about by Thomas Alva Edison, the greatest scientist the world has ever seen, simply pressing a prosaic button in his laboratory. Where these stately islands rose majestically out of the Atlantic one minute, they were nowhere to be seen the next. Although this is a satirical exag-

geration of the Wizard's inventive potentialities, yet it would be interesting to know when his crowning achievement will be attained. It was popularly opined that his *ultima Thule* was attained with the phonograph, fleuroscope, and kinetoscope. But Edison is not one of those who, when they have made some extraordinary invention, are content to repose upon their laurels and reap the pecuniary benefit accruing from the result of their handiwork. Each successive achievement only piques him to further attempts

by which he may benefit mankind. His latest invention, however, is of such magnitude and so stupendous in its conception that it completely relegates all his previous efforts, wonderful though they are, into insignificance. It has been said on more than one occasion that if the necessity arose he would remove mountains. This contingency has arrived, and Edison is removing the mountains. Every schoolboy knows that if you take a piece of iron ore, pulverise it with a hammer, and then bring a magnet into contact with the granulated mass, the iron molecules, fulfilling the laws of affinity, fly to the loadstone, leaving the pure sand undisturbed behind. Edison's latest consists of an application of this scheme upon a cyclopean scale. The result is that the United States, which now only mines about 15,000,000 tons of iron ore per annum, probably will become in the near future the market-place of the world for iron.

This marvellous ore-extracting process which promises to revolutionise the iron industry of the whole world, like many of his earlier inventions, arose from almost a mere accident. His phonograph was suggested by a pin-prick of the finger, and now his latest invention was created from quite as commonplace and insignificant a genesis. About sixteen years ago Edison was rusticated upon Long Island, United States. During one of his daily peregrinations upon the beach his observant eye was arrested by a bank of sand which the sea had cast up. It was not the white, silvery, shimmering sand so generally seen upon our seashores, but was of a deep sable hue. It was this peculiar colour that aroused his curiosity, and he made impromptu investigations upon the spot, formulating several hypotheses to account for this phenomenon, but did not arrive at a satisfactorily conclusive explanation. With his characteristic zeal and determination not to be beaten, he carried a quantity of the sand to his laboratory, where he proposed to carefully diagnose the case and obtain a veracious deduction. Suddenly an idea struck him. He laid one of his powerful electro-magnets near the puzzling heap. Instantly the substance was highly affected, and in a very few minutes there were two heaps—one, the original, considerably reduced in bulk, and another surrounding the magnet. A grim smile of complete satisfaction spread over the intelligent features of Edison. Why was it that they betrayed such an affinity for the magnetised steel? There was only one solution to the enigma. The little grains must be particles of iron. Then another idea, as weird as it was stupendous, now portrayed itself forcibly before the great electrician. Why not put the simple, obvious scheme to practical utility in such a manner as to make it worth while, from a commercial standpoint, to grind up masses of magnetite, and separate the iron particles from the sand by magnets? Edison is not a man to re-

cline upon a luxurious couch and hazard impossible theories at so much per dozen. When he advances a theory he immediately proceeds to put it into practice, even though it may entail several years of incessant labour; a thousand and one obstacles have to be surmounted, hundreds of experiments made, ninety-nine of which result in dismal failures involving ruinous expenditure of money. His fertile brain began to work to place his wild idea—it must certainly have appeared wild to a less audacious intelligence—into operation. It was perfectly feasible, though to make it profitable the crushing-machines and magnets would have to be of titanic proportions. But then such slight obstacles as these do not deter Edison, who is thoroughly at home with engines of herculean proportions and almost human ingenuity. For months he was busily engaged in mathematical deductions, intricate machine drawing, and what not. The outcome of it, after much grim perseverance, was that small machines were set up on the beach of Long Island, where he had discovered the mysterious black sand, and the new process of iron-smelting was begun. Alas! the enterprise was doomed to be checked while in its infancy. One night a severe gale raged, and all the black sand was withdrawn again by the sea.

Although the process had only been submitted to a very short and incomplete trial, it was sufficient to illustrate the complete practicability of his scheme. Flushed with his success, he floated a company, and the new process of ore extraction was commenced in grim earnest. Before venturing upon surveying journeys for the exploration of ore-yielding soil, with his characteristic ingenuity he devised a marvellous little instrument for divining the presence of low-grade ore in the earth. This delicate little mechanism consists of a strongly magnetised needle, similar to a mariner's compass, which deflects towards the earth when passing over beds of ore, thus betraying the presence of mineral which under ordinary circumstances would not be divulged. The indispensable utility of this ingenious little contrivance is obvious. Under former conditions iron could only be found by digging for it—a will-o'-the-wisp undertaking—but now a man can walk comfortably along with this needle in his hand, which is so delicately poised as to indicate even the slightest trace of iron. Edison was driving across the extensive wastes and gneiss rock of the mountains of New Jersey, when suddenly the magnetised needle reposing upon his knee became deeply depressed to the earth, and remained so for such a long time that Edison feared his divining-rod had become disorganised; but presently the needle returned to its normal position. Great was Edison's amazement upon this unexpected discovery. The earth must be richly impregnated with iron to affect the needle so violently. They investigated a wide area, and

still the needle was highly influenced, varying but little. Edison's wildest anticipations were more than realised by this remarkable *dénouement*. The upshot of these careful explorations was that a large expanse of land, some 16,000 acres in extent, was purchased by the company. Through this vast tract, at an average depth of 700 to 750 feet, extend for twenty miles six large veins of ore-bearing rock, besides several minor ones. Edison computes that in this area there are some 1,100,000,000 tons of iron ore, which is sufficient to last the States, at the present rate of consumption, for about eighty years. In 3000 acres immediately surrounding the works extends an enormous artery containing over 200,000,000 tons, which alone is ample to supply the whole world for about three years, and which will take the present plant over a hundred years to exhaust at its present average output.

Now that Edison had discovered a rich ore-bearing ground, huge buildings for the accommodation of the Brobdingnagian machinery sprang up like mushrooms. What was but a few years ago a barren, secluded spot in the wilderness now resounds with the clang, whirl, and grinding of machinery, hissing of steam, and the voice of man! The district in northern New Jersey where this unique industry is in full swing is called Edison, after the founder. It is a strange, straggling place of a motley collection of buildings, some towering and slender, others short and extended. Thick electric cables for the transmission of the currents from the huge dynamos to the various machinery sheds are ubiquitous. The air is reeking with dust from the huge amount of sand that pours out incessantly, day and night, in a steady stream from a towering shaft, and the men are provided with curious respirators to purify the air breathed. Narrow-gauge railways dot the landscape on all sides; and the diminutive engines with long lines of trucks dart in and out of the huge buildings as if playing at hide-and-seek. Whirling conveyors of all descriptions, from an endless chain of baskets to an endless rubber belt, abound everywhere; and if it were not for such marvellous labour-saving devices as these this huge factory would give employment to thousands of hands, instead of a little over two hundred, which constitute its present staff.

Edison is the sworn enemy of the trades unions. He is never so delighted as when he can jump up and say, while looking at some new contrivance, 'Another man dispensed with.' One of the most marvellous labour-saving contrivances ever called into requisition is the steam-shovel. This leviathan machine is as nearly human as anything possibly can be. It weighs some 200,000 lb., and in design resembles a crane, with its stupendous telescopic latticed neck, from which depends the immense steel head with its formidable steel teeth. The power controlling this ingenious machine is contained in a compact space

upon the body of the car, which rests upon a migratory truck. The rock is first rent asunder by dynamite blasting. The sinews of the mighty shovel are then set to work, the iron neck descends majestically, and, amid much hissing of steam, scrunching, and gnashing, the terrible steel teeth bury themselves in the disintegrated rock, which grates and grinds as the jaws close together; the neck is again raised, and the shovel withdraws slowly from the face of the mountain with some 12,000 lb. of iron ore in its great maw. It swings majestically round and disgorges its capacious mouthful into the skips reposing upon the flat trucks waiting upon the narrow-gauge railway near by. This shovel excavates about ten tons of rock every minute, and, working day and night incessantly, clears away from the mountain-side over 14,000 tons of low-grade ore every twenty-four hours. It is a wonderful sight to see this monster at work, and Edison will sit for hours watching it with satisfactory smiles as it tears and swallows the tons of rocks with the utmost ease. Occasionally, however, it becomes too gormandising and meets with an obstreperous mass of rock. Then the exertion and strain is terrific, but at last something gives way—almost invariably the rock; but on one occasion it was the engine, which, sooner than release its grip, toppled over.

As this shovel withdraws some ten tons of ore per minute, and there are two such shovels, though the second is a trifle smaller, as may be naturally divined, the railway trains conveying the ore from the excavating grounds to the crushing plant are kept pretty busily employed. When a train has obtained its consignment of rock it steams away into a huge building, in which, upon a platform several feet above the ground, are two or three tremendously powerful electric cranes. As the train passes underneath, the skips are rapidly picked up, whirled round, and the contents discharged through a yawning abyss in the floor, accompanied by a roar and rattle and an impenetrable pall of dust, into the crushing-machines below.

The crushing-machines, following Edison's customary system, are most stupendous in construction. They consist of two Gargantuan rollers, over six feet in diameter and four feet in width, and weighing over 235,000 lb. The surfaces are studded with huge bosses, and the rollers revolve within eighteen inches of each other. When viewed at a standstill they appear too ponderous for rapid movement, yet when running they attain a velocity of over 290 revolutions per minute—equal to almost a surface of a mile. When the huge boulders come crashing through the roof above into the machine they are caught by the inexorable teeth and immediately reduced to convenient lumps about the size of coco-nuts. The noise created by these terrible engines at work is frightful, and the giant rollers grind up the

rock as fast as the skips can discharge their cargo. The average output is some 300 tons per hour. After the boulders have passed through this machine they pass through another series of crushers, the rollers of each successive machine being placed nearer together and studded with finer teeth. After emerging from the last machine, what was a few minutes previously an unwieldy mass of ore several tons in weight is now reduced to the consistency of fine powder.

Gigantic though these crushing-engines are, the mechanism that controls them is of a most delicate and intricate nature. There are in all over 4000 bearings, yet they can never be choked, as they are so constructed that grit and dust are a *sine quâ non* for their movements; while, to guard against the possibility of accentuated currents, which would probably tend to disarrange the machines, safety-fuses are plentifully provided, which sever the current directly it becomes of more than the required intensity. Again, the machine is only capable of withstanding a certain strain, and when this is attained, which is very seldom, the 'breaking-pins' snap, and the whole of the colossal machinery is brought to a standstill. The 'breaking-pins,' which are one of the salient characteristics for the prevention of accident, are graded to the one-thousandth part of an inch, and fitted to every piece of mechanism which has to withstand a strain, however moderate.

Another curious fact is that the power which drives these enormous rollers does not accomplish the pulverisation. The engine is only of sufficient power to impart a high revolving celerity to the rollers. It is this tremendous momentum, coupled with the extreme weight of the rollers—nearly seventy tons—that executes the crushing. For instance, suppose a large piece of rock about six tons in weight falls into the machine in such a manner as to offer a momentary resistance to the rollers, a simple contrivance by which the rollers are connected with the engines disengages the latter, so that no impetus is supplied during the moment the piece of rock impedes the progress of the rollers. But seventy tons of metal, whose peripheries have almost a mile a minute, require tremendous force to resist their progress. This brittle rock cannot do, and the next instant it is smashed to fragments, and the engine immediately resumes contact with the rollers. At the outset Edison had a great deal of trouble with these rollers. The 'breaking-pins' attached to a certain part of the machinery kept snapping, without any apparent reason, as rapidly as they were renovated. Edison sat and watched the feeding very closely, but could assign no reason for their refractoriness. After a week's patient and monotonous vigil he entered his office one night, and exclaimed to his indefatigable associate, Mr Mallory, 'I'm not going out of this office until I find out where the "bug" is.' He

forthwith sat down at his desk, and was deeply immersed for several hours in abstruse calculations. Suddenly he jumped to his feet and cried exultantly, 'I've got it.' He had; the defect was remedied, and the machine has run smoothly without a hitch ever since.

After the rock has passed through this crushing plant it is ready for the extraction of the ore. First passing through the drying-machine, it is carried by conveyors to the ore-separator, or, as it is vernacularly called, the 'refining-mill,' and this phase of the process is the most interesting, because here a most wonderful metamorphosis is effected. The refining building is a lofty structure six stories in height, and the pulverised ore is conveyed to the uppermost floor. From this top story the sand is permitted to gravitate in a thin shower from room to room, separating as it goes. Altogether, it has to pass four hundred and eighty magnets, arranged in three sets, each of varying intensity. The first set is the weakest—that is to say, it has the least energy and attraction; the second is medium, and the third has the strongest deflecting power. The powdered iron, of the consistency of flour, is now ready for smelting, but first it has to be solidified, otherwise while in the furnace the blasting would blow an immense amount away. The convenient conveyor again catches it as it falls from the chute in the refining-mill, and whirls it to the mixing-house. Here the pulverised iron is thrown into revolving cylinders along with a special adhesive substance which binds every particle of iron securely together.

Edison had considerable trouble in the search for a proper medium for this mixing process, and had made over seven hundred experiments before he alighted upon the ideal. As the iron, now closely resembling dough, exudes from the end of these cylinders, it is caught by an endless rubber belt five hundred feet long, with a conveying capacity of one hundred tons per hour to the 'briquetting building.' The main object of these briquetting machines is to force the doughy mixture through a small orifice about two inches in diameter, at the same time subjecting it to a pressure of a thousand pounds to the inch. The iron issues from this machine in small round knobs, called briquettes, about three inches long and two inches in diameter. They are now baked so that they should be of sufficient toughness to stand shipment. From the briquetting ovens iron rope conveyors hustle them along and discharge them into the railway trucks by which they are carried to the vessel's side. An immense amount of the iron is exported to this country; and this is where England benefits by Edison's enterprise, for no other nation can manufacture iron so well as we can do. As our supply of iron, also, is not sufficient to meet our demand, this American iron is most welcome. It is a noteworthy fact in this remarkable industry that not once in the whole process, from its crude state upon the mountain-side until

it is transported, is the material touched by human hands. All is done by machinery.

When the sand has gravitated from the top story of the refining-mill to the basement, completely destitute of even the minutest particle of iron, it is transported by a conveyor through a towering latticed derrick, from the extremity of which it spouts in a copious constant stream, making a veritable mountain in itself. From a distance this sand-fall presents a picturesque sight with the sun glancing upon its shimmering particles. This sand, although refuse so far as the iron-mining is concerned, is yet a valuable commercial product, being extensively purchased for building purposes, for which it is more

suitable than the seashore sand, as it is what is technically called 'sharper.' When it is recollected that of every ton of excavated ore about three-fourths are pure sand, it will be readily seen that Edison is literally moving mountains.

Edison had the greatest confidence in his invention; and although it has taken many years of patient and determined labour, endless experiments, ninety-nine per cent. of which resulted in disheartening failures—Edison has himself confessed that he only expects one practical result out of every hundred experiments undertaken—and the expenditure of thousands of pounds of money, it is now one of the greatest engineering triumphs the world has ever seen.

A BRIDEGROOM ENTRAPPED.

By AGNES GIBERNE.

CHAPTER I.



YOU think you really must go, John dear?' she said, and she spoke with an air of reluctance. We were within twenty-four hours of becoming man and wife, and it seemed to have come upon her as a surprise that I could think of anything in the world except our impending marriage. I certainly felt, for my part, all that a bridegroom can reasonably be expected to feel on the brink of wedding the girl of his choice; but perhaps a man is seldom so utterly wrapped up in the one object as is a woman under like circumstances. It so happened that, at this particular epoch of my existence, a second question of importance claimed attention. To be brief: I had a book in hand—the first I had written; and that book—no mere novel, but a weighty volume of early English history—was nearing completion. Those who have written books will know what this means, especially in the case of one's 'maiden' effort. The year which should see me a wedded husband might also see me a successful author.

I had, however, come lately to almost a standstill for lack of information on a certain subject, which information I believed to be obtainable from one man alone. This man was a distant cousin of Laura's, the Very Rev. Dean of a certain city situated about two hundred miles away. The Dean and I had never met, but I looked forward to making his acquaintance after our honeymoon. My book, so far as completed, had been read and approved of by a publisher; and arrangements had been made for its publication in the autumn, provided that I could get it done in time. Therefore our 'moon' was to be scarcely more than a half-moon; and so soon as we returned to England I meant to seek out the good and learned Dean, pleading, as I should then be able, our new connection, and craving his help.

But on the very eve of our wedding-day news reached me that the Dean was on the point of starting for a lengthy tour on the Continent. Another twenty-four hours and he would be out of reach for months, perhaps for a year. The questions that I had to ask could not well be written; at all events, I could not hope that the Dean would fully answer them by post. He would be away from books of reference; his letters were always short to excess; and he was famous for an absolutely illegible hand. I wanted his general opinion upon a somewhat complicated question connected with a considerable period, and involving the characters of two or three eminent personages. Half-an-hour's talk would be worth more to me than half-a-year's correspondence.

Nothing remained but to start off there and then for a chat with him before he should leave home, sending a telegram to announce my purpose, and pleading future instead of present relationship. He was said to be a charming man, full of learning, genial as sunshine, delighted to give out from his stores of knowledge. I had but to place myself in his presence, and wisdom would pour from his lips, like water from a Swiss fountain fed by ever-melting snows.

True, I should have to leave Laura on this last day, and I should have to travel hard.

Weddings in those years were over by midday. If I found the Dean in, if he were free at once to attend to me, and if a short talk sufficed, I might catch the half-past ten return train, and get back about midnight. Otherwise I should have to wait till early morning, to travel by a slow 'parliamentary,' and probably to be restricted in time for changing my clothes. Still, the thing could be done; and I made Laura understand that I fully intended to be off by the earlier train.

Despite these assurances she seemed unhappy,

and she persisted in looking upon the small separation as a serious affair. Actually there were tears in her eyes. I rather wished that she could resolve to shorten our leave-taking. The dear girl had always so much to say, while I felt that there were few minutes to spare, and I was also anxious to escape with a mind free for historical analysis.

'So you think you really must go, John dear?' she began over again, just when I believed that I had fully convinced her of the necessity. 'It seems such an enormous distance! I know you will never manage to catch the 10.30. You'll be so wrapped up in some horrid old Saxon chronicle that you will forget all about the wedding until it is too late. And then I shall see nothing more of you till we meet in church. That slow train is always late, so you will rush up at the very last moment, when everybody is in an agony, and we shall be married in a scrimmage to get done before it strikes twelve, and you will be fearfully untidy, and so sleepy with your bad night that people will say you are miserable at being married to me. Just think! And if your train breaks down, or if you have an explosion or a collision, you may never come back at all.'

'But, my love, we are not going to have either an explosion or a collision, and nobody could possibly call me miserable, because I am just the reverse,' I said, with a furtive glance at my watch.

'You can't tell. Accidents are always unexpected, and they always come at the most inconvenient times. If you don't manage to get your tie straight, that will be quite enough to make you look wretched. You don't think'—coaxingly—'that you might put off till the Dean comes back? It would not be really long, you know. Does it matter so very much? We shall not be depending on your pen for bread and butter, after all; and if your book did not come out this year, it might come out next year instead. Then you would not need to work all day long either. I'm beginning to be just a wee bit jealous of your pen, do you know?'

'My dear, I don't think you quite understand,' I said, with studied mildness. 'I am just now in full swing with the work'—

'Most men in love wouldn't be able,' she murmured; and this was disquieting, but I went on as if I had not heard: 'And if I were to lay it aside for six months or more, I might never feel inclined to take it up again. Don't you see?'

'That would be a world-wide misfortune,' she said; and if she had spoken less pensively I could almost have suspected her of laughing at me. Then her eyes again became wet. 'Would it matter, John? Would anything matter—so long as you and I are together?'

'I think it would, my dearest,' I said. 'That, of course, is a pretty and graceful view of the matter; but one's duty has also to be considered. I have my work in life to do, and mere pleasure must not be

allowed to stand in its way.' To this point I held steadfastly, and within five minutes I was off.

It had not been my fate to be always in touch with Church dignitaries. Plain John Smith, of no particular family, could hardly expect to be sought after by dignitaries of any description. But John Smith, plunged deep into the story of early English history, becomes, perhaps, a more important individual. Strong in this belief, I presented myself at the Deanery with no flutterings of trepidation; and I was not in the least surprised to meet with a right cordial reception.

To be sure, the Dean had won a reputation for universal kindness. His worst enemy—if he had ever had one—needed not to have feared going to the Deanery. He would have been received with beaming smiles and with the best of cheer. I might myself have been the Dean's nearest relative and dearest friend, judging from his outstretched hand and the radiant smile which lighted up his fine features. He apologised for the absence of his wife and daughter, who had departed by a train previously fixed upon, while he, on receiving my telegram, had at some inconvenience generously put off his own going for an hour or two that he might respond to my wishes. It was the only chance, as he meant to stay abroad for a year. Absence from work had been ordered for him; and, indeed, though vigorous in speech and movement, he looked very spare and worn.

Would I come at once to the library, he asked, to lose no time? Barely an hour remained before he had to start. The luggage was gone, and everything had been arranged. He was leaving the place in charge of a couple of old servants. These facts he mentioned casually, and then he asked—How about food? Would I like?—

'Nothing at all, thanks,' I said hastily. 'That is all provided for.' By which I meant that I could get something to eat at the station by-and-by.

The Dean looked perhaps a little relieved. 'Then you have friends in the place. That is right,' he said, and I did not take the trouble to correct him. I begrudged each moment that was wasted in chit-chat.

Through a much-littered hall we passed into a long passage, which led to a second passage, and that to a third. Then we went up a little winding staircase and into a large library—oblong in shape, with three windows, all on one side and all placed so high that no one standing on the floor could see out of them. It was a lofty room, and the walls were absolutely lined with bookcases, interrupted only by the windows and by a single oil-painting over the mantelpiece. The very door was a part of the bookcases, opening inwards, as I noted in passing. I remembered nothing further about the matter.

Two cups of coffee and some biscuits stood waiting, and the Dean offered me one, hoping that it was not cold. Again I had to decline, time being far too precious to waste in coffee-drinking.

It was not quite easy to bring the Dean to a point. He was in the unsettled mental condition of one about to start on a long journey; so that something of a wrench was needed to carry him from an atmosphere of luggage and railway-tickets to the perplexities of Saxon history. Moreover, he liked to expatiate upon the merits of his library, upon its quiet and retirement. No sound of passers-by could penetrate those thick walls, and its position cut it off entirely from all household stir. 'When I am here I seem to be in a world alone,' he said, smiling. I listened impatiently, not guessing how soon those facts would possess a keen interest for me. With an effort I turned him to the subject of my book; and he leant back in an easy-chair, his pale hands lightly joined. 'Yes, yes; you wished to ask me something,' he said.

I dashed into my explanation. In the train I had conned it over, thrusting away superfluous words; and I flatter myself that the difficulty was well stated. At first the Dean's eyes wandered, but in three minutes I had his attention. Once or twice he gently nodded his head. 'Good! Well put!' he murmured. Then, when I paused, he sat lost in thought.

'Yes, I could say a good deal to help you if there were time,' he murmured. 'But'—he took out his watch, looked at the hands, and laid it, face upwards, upon the table. 'A few hints are the most that I can manage. If, however, you would care to remain here for an hour or two after I go, pray do so. I can direct your attention to a few books, into which you might dip. Here'—he walked across to a bookcase between two of the windows, and began pulling out one volume after another. 'Have you pencil and note-book? In a couple of hours you may do a good deal if you are a rapid reader. What time must you start?'

I hesitated. 'At ten, perhaps; but, if necessary, I can stay longer.'

'Right.' He stood for several minutes, turning to passage after passage with the secure rapidity of a man at home in his books, slipping in scraps of paper as a guide to me. Then he returned to his seat, and the flow began. He spoke with few pauses, not fast, but steadily; and the breadth of knowledge shown was amazing. He never hesitated for a name, a date, a fact. I was kept hard at work, scribbling memoranda of what he said, scarcely needing to ask a question, only jotting down page after page of thoughts for future consideration. Time flew on wings. I could have listened thus for twelve hours at a stretch.

Suddenly he broke off in the middle of a sentence. 'Time is up. I shall miss my train.'

'But you were saying'—I gasped.

'Nothing of importance. Merely as to—You will find all that you really want in one or another of those books.'

'If you could just have told me'—

'My dear friend, I *must* be off. I am under a promise. Nearly ten minutes past the time I fixed; and the carriage is outside, waiting. Half a minute more may mean the loss of my train. No, no; not a moment. But stay as long as you wish. Pray do. Make any use of my library. Good-bye! They ought to have reminded me of the time! Good-bye, good-bye!'

One grasp of the hand, and the venerable Dean was gone, literally with flying coat-tails. No schoolgirl ever rushed more frantically out of a room, or banged a door behind her with more excited ardour. I could hear his feet going down the winding stair and along the passage beyond, till lost in distance. Then came a pause; and soon I heard, faint and far, the sound of receding wheels, after which silence settled down upon the place.

I carried the lamp closer to the pile of selected books, and sat down, resolved to make the most of my opportunity. First one volume, then another, I searched into, glanced through, and copied from, with eager energy and enchainment interest. Those passages to which the Dean had specially referred me proved to be hardly less weighty than his spoken suggestions. He was a wonderful man, I thought; and I smiled at the recollection of his impetuous flight.

The striking of a clock somewhere in the room aroused me. Ten! Just time to put my things together, speed to the station, and catch the 10.30. But—those volumes still untouched! What could I do? To leave them would be heart-breaking. It did not at the moment occur to me that I might, after the honeymoon, ask leave from the Dean to pay another visit to his library. I was full of my work, absorbed in the present research; and, after all, the second train would do. Why not wait and travel by that? Laura had said that she did not expect me by the earlier train. So down I sat, hastily munching a biscuit to allay cravings which insisted on making themselves felt. Hardly surprising, since I had had only one cup of coffee since early lunch.

Almost instantly I was again deep in my work; and this time nothing disturbed me—not even the striking of eleven and twelve o'clock. When at length, feeling somewhat stupefied, I lifted my head and looked round, conscious of failing light or sight, the little clock struck ONE with silvery impressiveness.

'Hollo!' I muttered. 'I had not a notion how time was going.' Was I faint for want of food? That question came naturally, for the room seemed cold, and the light was very dim. Then I saw that the lamp had burnt away all its oil, and was quietly dying out. With a hasty spring I reached the mantelpiece, found a box of matches and a red candle in a diminutive candlestick, and lighted the wick just as the lamp-flame ceased to exist.

The large room looked weird and ghostly in the pale flicker of one tiny candle, and I caught

myself shivering—partly, doubtless, from want of food, partly from the chill of a spring night, inevitable even when the days are fairly warm. I stretched myself, yawned, drank a cup of cold coffee, and disposed of three or four biscuits. After which I returned the books to their places, mentally thanked the Dean for solid help afforded, folded and tied together my papers, and turned to leave the room.

Turned! But which way? No door was visible.

A moment's sense of bewilderment, followed by a laugh. It was absurd. I believed myself to have noticed, as we came in, that the door was a part of the general bookcase, and that it faced the three windows; and I ought to have observed its position more particularly when the Dean made his hurried exit, but I had been then too much absorbed to give full attention. It seemed to my recollection that, when he rushed away with flying coat-tails, he had gone in the direction of the wall opposite the windows, but I could not be sure. I had turned so quickly to the books as not to watch his actual departure.

However, the door had now to be found. Once out of this room, I could easily leave the house. If heard I might, indeed, be mistaken for a burglar; but that had to be risked; and no doubt the Dean had mentioned to his servants that he was leaving me in the library.

Had he done so? or had he in his hurry forgotten? It seemed curious that one of them should not have come to speak to me before going to bed. If he said nothing, they would naturally conclude that I had taken my departure before himself.

With the little red candle in hand, I hastily traversed that side of the room which lay opposite to the windows, feeling for the door and searching for tokens of its existence, but feeling and searching in vain. This would not do. I began over again a far more careful examination; and still the result was failure. There was no sign whatever of any possible opening. I felt and thumped, pulled and pushed, to no purpose. A solid wall of bookcases shut me in.

A third time I went over the same ground. Perhaps some spring had to be touched, or some button had to be pressed, or some string had to

be pulled. Inch by inch I explored the wall and the adjacent floor; but no break in the shelves became apparent, no spring or string or button could be discovered.

Was it possible that I had mistaken the wall? What if, after all, the door were in the end of the room opposite the fireplace? I went over that side also, foot by foot, with exceeding pains; and still failure rewarded my efforts.

I was getting tired, worried, and anxious. These huntings took time; and the slim red candle, carried to and fro, wasted fast. Soon I should be left in darkness.

The early morning train started at five o'clock; and if I could not get out by then no chance remained of my reaching home in time for the wedding. Perspiration broke from every pore with the bare idea. I pictured the assembled crowd in church, my Laura in her white dress and veil, with a pale face of fear, vainly waiting for her bridegroom. What would she think? What *could* she think?

But this was nonsense, absurdity. The door existed, and I simply had to find it. There was plenty of time, if only I could have been sure of plenty of light. Anyhow, I *had* to discover the door and to make my escape. The thing had to be; and the very notion of serious difficulty was too ludicrous. That I, a sensible, prosaic modern Englishman, should be mewed up in a doorless prison, like any unfortunate knight of the Middle Ages, could only make one laugh. So I told myself, though it made me angry too.

The clock struck one! two! Three hours remained before my train would start.

Slowly and doggedly I went round, testing every inch of those two walls. There unquestionably the door was, if only I could alight upon it. I had not come in at the fireplace-end of the room; that at least I knew with certainty; and the window-side was an outer wall. Again I hammered and shook, I poked and pushed, I tried and tested, making noise enough, one would have thought, to awaken the seven sleepers. But no opening, no sign of a possible doorway, could I discover.

My candle flickered and went out. In breathless despair I dropped upon the nearest seat.

WOOD PAVEMENT AND WHERE IT COMES FROM.



VERY few of those hundreds and thousands who daily travel the wood pavement laid down in so many of our London thoroughfares, or who have at some period in their lives stood and watched the process of laying it, have much idea of where all this wood is obtained, nor have they any idea of the process used in cutting it into blocks of the requisite size.

Various kinds of woods from all parts of the world have been tried, and of late years the Tasmanian 'stringy bark,' a species of the Eucalypti, has proved to be the most enduring, and without the glass-like surface of some other hard woods. The stringy bark, which grows all over Tasmania, has a rougher surface than the blue gum, thereby giving in greasy weather a better foothold for man and beast. It is in the south of the island.

of Tasmania that the chief supply of timber is obtained, the forests coming down almost to the water's edge, thus making the cost and difficulty of transport very small; in fact, at some of the mills vessels of three thousand tons could partly load alongside the pier, and complete their loading by barges while lying in a perfectly secure anchorage. We will now take a ramble round a typical southern Tasmanian sawmill.

Leaving Hobart by one of the small steamers which run daily to the ports down the D'Entrecasteaux Channel, which divides the two islands of Bruni from the mainland, we arrive at our place of disembarkation, and after a drive of a few miles across the island of South Bruni we arrive at our destination. What strikes the stranger's eye at first are the mountains of sawdust which we see in every direction; in fact, the beach is being fast covered up by it. Standing back a little is a comfortable-looking residence, occupied by the manager; and scattered about are the cottages of the employés, many of which have gardens attached, where vegetables and flowers can be easily cultivated. Attached to the mill there is also a general store, where anything and everything can be obtained. The mill has a forty horse-power engine driving the breakdown and circular saws, and it is capable of cutting about thirty thousand feet of timber daily. Leaving the mill, we proceed, under the guidance of the foreman bushman, along a wooden tramway, which runs right into the forest. In the early morning, before the sparkling dew is off the foliage, the whole scene is one of great beauty; and, unlike most of the other colonies, there is plenty of music from the whistling dicks, blue wrens, and other feathered denizens of the Tasmanian bush.

The tramway runs for about three-quarters of a mile on a perfectly smooth level, and then begins to rise with a gradually increasing gradient till we near a portable engine at the end of the tram. This engine is provided with a drum and six hundred feet of wire rope. Its use we shall shortly see. It is in this spot that the logs are loaded on to the trollies and sent down to the mill, the trollies being provided with powerful brakes. The first part of the journey is accomplished by the bare weight of the load, and it

finally stops upon reaching the level, where a team of horses drag it into the mill. But the foreman is calling us to come on, and, clambering up a rough track, we find the wire rope all along it, and at its end a large iron shoe, in shape something like a snow-plough; on this now rests the end of a fine log some twenty-four feet long and seven feet in diameter. The foreman and his gang see all clear, give the word, round goes the drum, and, willy-nilly, the log is hauled out to the siding, where it is soon secured on the trollies and despatched to be made into wooden pavement. The foreman bushman's duty is to select and cut down the timber, and when one patch is worked out, to go on till the engine is too far away to be of use. Then comes a short lengthening of the tramway, or the transfer of the engine to the other side; if the former is decided on, the engine is unlashd from the stump to which it has been secured, put upon the rails, and drives itself farther uphill, it being capable of going up a gradient of one in four.

On returning to the mill from the forest we see our log passing through the first series of saws, or the 'breaking down,' as they are called, and then finally the slabs reach the circular-saw bench, where they are cut into planks nine and a half inches wide and four and a quarter in thickness, thus allowing for the shrinkage to nine by four, which is the requisite size for blocks.

The reason that they are not cut into the small blocks at the same time is that the extra amount of handling and storing would greatly increase the cost of production. From a log of the size of which we have been speaking, nearly four thousand blocks could be obtained. As the planks are cut they are shot down to the timber-men, who load up the trucks, carefully examining each plank for flaws, and they are then run out to the jetty for stacking, or shipment if the craft is waiting. In most cases, however, it is sent up to Hobart by the ketch belonging to the mill, where it is again stacked and inspected, and at last finally shipped to Europe. As regards the lasting powers of the stringy bark, that, of course, has to be proved, but judging by the durability of the railway-sleepers on the government lines, a renewal once in seven years ought to be sufficient.

SALVAGE: AN EPISODE.

By BENNET COPPLESTONE.



HE waves were tearing the shingle at my feet, and in front a mile of breakers roared on the terrible White Ledge. Out at sea the flash of a signal-gun cut the darkness, and the tatters of a report trailed down the wind.

'She's on the Ledge,' said the sailor Jim, without excitement.

But Cap'n Tom of the tug *Osuikers*, of which the baptismal name had been *Aux Secours*, pulled out his watch and waited. The gun flashed again, and we listened for the tardy report.

'Eight seconds, good,' timed the Cap'n. 'She's half a mile clear of the Ledge, and drifting into the bay.'

'It doesn't matter,' commented Jim, 'for she's

bound to knock her nose against Straight Point.'

'That's true.' And the subject seemed to be removed from further interest.

I was a landsman and raw to these business-like calculations. To me the drifting ship meant a load of helpless human beings rushing upon destruction, and I turned fiercely on the Cap'n.

'Are you going to let the poor fellows perish without making an effort to save them?'

The Cap'n was unmoved. 'It ain't no business of ours,' he said. Jim was more explanatory.

'You see, sir, there's a lifeboat down to Beale, a new-painted thing, very pretty. They love to play with her, taking her out and upsetting to see how she works. The crew's never had a wreck, and that ship will give them the chance they've prayed after for months. We've got no call to interfere.'

'The Almighty,' put in Cap'n Tom with solemnity, 'has His eye on the Beale folk.'

A coastguard broke out of the darkness. He pointed towards the sea, and cried, 'Do you know who she is, Tom?' The manner of the man was that of one hugging valuable news.

'No,' said Cap'n Tom. 'Some furrin tramp, I suppose.'

'I thought you didn't, or you wouldn't be fooling here. She's a Dutch steamer bound for Southampton, fifteen hundred tons, in hardware and toys. The propeller shaft's broke. Now, sir!'

Cap'n Tom and Jim uttered a simultaneous gasping roar, and turning, pounded over the shingle at an incredible speed. I followed in their tracks, and, when they reached the high-road leading into Brightmouth, was able to overtake them. The men ran in silence except for the sound of their groaning lungs, striding ponderously like booted elephants.

Five minutes later we stood on the stone pier by Brightmouth jetty. The tug *Osukkers* lay under steam, grinding the fenders as the swell heaved her towards us. Jim dropped in at once, but I arrested the Cap'n for an instant.

'Why?'

'Salvage,' he muttered, jerking away from my grasp and leaping into the tug.

'May I come?' I shouted. The Cap'n had already cast off the fore mooring-rope, and now ran to the stern. 'You won't want a share?'

'No.'

'Jump, then.'

I jumped, and the screw began to throb.

The Cap'n took the wheel, and I stood beside him. Jim was forward on the lookout, and the crew of two tore coal out of the boat's bowels and cast it on the fires.

We ran due south in order to clear the White Ledge, which lay to the east and stretched seawards for a full mile. The gale blew heavily from the south-west, so that, when we were no

longer sheltered by the harbour, we received the full weight of the Channel on our tubby bows. It was midsummer, but the deep water is never warm. At every plunge twenty feet of spray shot into the air and rained cold as hail upon my wretched body. For a long ten minutes this misery continued, and then the Cap'n threw the tug's head before the wind. The change was wonderful. The waves sank down, and the gale was left behind, as we rushed down the trail of the disabled steamer. She had a start of about three miles; but the bay was wide, and the *Osukkers* was travelling at three times her speed.

'Shall we be in time to save the crew?' I asked.

'Oh, hang the crew!' grunted Cap'n Tom. 'I'm after the ship. She won't go ashore under half-an-hour, and we shall catch her in twenty minutes. The *Osukkers* has heels.'

Presently the heels of the *Osukkers* left the water at every pitch. The wind was on our starboard quarter, and we hurtled over the running seas. The Cap'n let the propeller race as it pleased. 'We ain't a blooming liner,' he observed. We passed the breakers raging on the White Ledge, heading due east for Beale.

'Master,' said the Cap'n cheerfully, 'give me a disabled ship, a valuable one, and I'm a bloodhound.' I reminded him of the eager lifeboat crew praying daily at Beale for wrecks, and he broke into a gale of laughter. 'We pray too,' he cried, 'and the prayers of a salvage skipper are powerful efficacious, especially when he owns a twelve-knot tug.'

We rushed down the trail of the German steamer, and ere long a dark waving patch appeared in the gloom ahead. 'Shake her up,' cried Cap'n Tom. We shut off steam on the lee side of the chase, drifting with her. I saw a thin line strike our bows like a whip-lash. Jim's hand was upon it, and running aft, he hauled on board the bight of a wire towing-cable. Then the *Osukkers* dashed ahead, and, passing under the nose of the quarry, strained out to sea. The rope drew taut. I fell instantly upon my back, and a wave rising over the quarter washed me into the unprotected cockpit. When I painfully arose the tug was toiling at full speed with little way. Cap'n Tom watched for the Bremener's bows to drag round. 'She's got to come away ten points, good,' he said. 'Hurt yourself?'

The wind was now almost abeam, and every sea broke on board. The awful drag astern held the tug down, and at every interrupted plunge she shuddered with effort. Cap'n Tom gravely regarded the superfluity of water, and, trusting the wheel for a moment to my hands, he battened down the hatches and drew tarpaulins over the engine-room gratings.

We drove across the waves, the German ship following like a black ghost. I stood, a forlorn

spar, amid the rushing water. 'There's more water than we want,' admitted the Cap'n, 'but it serves to keep our little kick-up covered.'

When Straight Point was at last cleared, the tug seemed to draw out of her grave perils and joyfully to stand inshore for shelter. But shelter came too late. The wind and the waves had done their work. The tarpaulins had been stripped away, the engines moved amid a wash of water, and the crew of stokers vainly dived into black pools and strove to feed our fires with streaming fuel. Cap'n Tom's face dropped with the steam-gauge. The tug's heart was failing her for want of fire. 'Oh! shake her up,' roared the desperate skipper; and there came back a hoarse, undisciplined murmur, 'Shake her up yourself; we can't.'

The tired propeller flapped feebly and then stopped.

I saw the towing-rope curl up over our stern and the tall hull of the German sweep towards our rudder. Jim's long body shot past me, the rope was cast off, and with a dying flicker of the screw we wriggled aside. As we lay with head to the wind the rolling German vessel slid away into the darkness, the yells of the helpless sailors tearing at my heart.

'She's lost,' I cried.

'Well, she's got a powerful lot of water to be lost in,' growled the Cap'n. 'Oh, hang! there goes the fool popping again.'

'Two days later, about midday, I chanced upon the Cap'n and Jim. They looked rather hilarious.

'Good luck, mister,' roared the Cap'n when yet a great way off. 'Come and wet it.'

'Ship was taken up by a tug out of West-haven, and is safe in port,' said Jim.

I wetted it.

'Your joy is most generous after our night of disappointment,' I observed kindly.

The Cap'n smote Jim a terrible blow upon the shoulder. 'Hark to that. We're noble fellows.'

'The gentleman is what they call soft,' remarked Jim reflectively. 'Say, sir, can you figure—do sums?'

I asserted that my 'sums' were models of skill and accuracy.

'Half of fifteen hundred pounds is seven hundred and fifty pounds, ain't it?'

'Undoubtedly.'

'Two shares for the Cap'n; three for the tug—which is only another name for the Cap'n, cursed old Jew; one for Jim Cornish—that's me; one for Bob Westlake; and one for Fat Jack. How many's that?'

'Eight.'

'What does each one figure out at?'

I solved the difficult problem and presented Jim with the result.

'Ninety-three pounds fifteen shillings,' he re-

peated. 'It sounds a lot, but I shall understand better if you put it in beer. How many quarts of'—

'Oh, come,' I said, laughing. 'Enough beer to swim in—to float the tug in.'

While Jim silently contemplated his unlimited good fortune as measured in beer the Cap'n entered into explanations.

'The Dutchman would have gone ashore but for the *Osuikers*, so we had first claim. I ain't a blooming Scotchman as wants everything, so I arranged with Cap'n Winks of the *Mary Jane*—her that finished the job—to join as partner over this salvage. I says, "Halves," and halves it was. Then we telegraphed to the owners at Bremen, and got the skipper of the steamer to telegraph too. We said, "The salvage tugs *Osuikers* and *Mary Jane* saved your ship *Kaiser*, and claim £1500;" the skipper said, "It is all right—they did;" and the owners said, "Done; apply for cash at Southampton." You see, sir, the Admiralty judges love salvage-tugs. They say that British commerce couldn't get along nohow without us, and we ought to be encouraged. Owners wouldn't pay us if they could help it; but they've got to, the judges are that sharp. So you see, sir, we haven't done badly over that little trip the other night. When we go out again you may come if you like. It's in what the newspapers call "the cause of humanity," and there's nothing like humanity, especially when it's properly rewarded.'

Cap'n Tom shook my hand, with tears in his eyes, and turned to hide his manly emotion in the flowing bowl.

FLAWED ROSES.

It was here on the terrace they plaited this morn

The crown for the bride;

And these be the roses rejected in scorn,

Flung idly aside—

Flawed buds, which they reckoned not fit to be worn

On her tresses of pride.

Pale blossoms that drank of the sun and the dew

Like your lovelier kin;

Here's the track of the snail as he crept over you,

Silver-shining and thin:

And lo! on this bud as it broke to the view

Where the sly worm crept in.

Here, pressed to the stone yet a-lean to the light,

You were shapen amiss:

And the spider has woven his tapestry slight

Like a veil over this.

Each meant to be perfect, yet failed by some blight,

So was balked of all bliss.

Frail flowers, plucked to perish, disdained and cast down,

I gather you now—

Hark the peal of the bells!—not to weave in a crown

For a beautiful brow;

But only to wither, shrunk, faded, and brown—

My heart tells me how!

A. S. F.